Happy Summer!

In an effort to prevent the dreaded "Summer Slide", we are sending home this math packet for students to work on at their own pace over break.

The topics included are entirely a review of what we learned this past school year. If your child comes across a topic they have forgotten, don't worry! Most pages have a quick refresher at the top to help them get back on track. Students can also search for helpful instructional videos on Khan Academy if they need a little extra guidance through any of the topics.

This complete packet will be due by the end of summer vacation. Keep those math skills strong, and I look forward to seeing your student in the fall!

Have a safe and happy summer!

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Topics for incoming 7th graders include:

- Rename Fractions, Percents, and Decimals
- Order Decimals
- Multiply and Divide Whole Numbers
- Add Mixed Numbers
- Subtract Mixed Numbers
- Multiply Fractions and Solve Proportions
- Add and Subtract Decimals
- Multiply and Divide Decimals
- Order of Operations
- Solving One-Step Equations
- Find Percent of a Number
- Coordinate Plane
- Geometry

Rename Fractions, Percents, and Decimals

Hints/Guide:

To convert between fractions and percents, we must first convert fractions into decimals: We start with the fraction, such as $\frac{3}{5}$, and divide the numerator (the top number of a fraction) by the denominator (the bottom number of a fraction). So:

$$\begin{array}{r} 6 \\ 5 \overline{)\,3.0} \\ -\,30 \\ \hline 0 \end{array}$$ $\frac{3}{5}$ is equivalent to 0.6 OR $\begin{array}{r} 0.22\ldots \\ 9 \overline{)\,2.00} \end{array}$ $\frac{2}{9}$ is equivalent to $0.\overline{2}$

To convert a decimal to a percent, we multiply the decimal by 100 (percent means a ratio of a number compared to 100). A short-cut is sometimes used of moving the decimal point two places to the right (which is equivalent to multiplying a decimal by 100, so

$$0.6 \times 100 = 60 \text{ and } \qquad \frac{3}{5} = 0.6 = 60\%$$

To convert a percent to a decimal, we divide the percent by 100,

$$60\% \div 100 = 0.6 \qquad \text{so} \qquad 60\% = 0.6$$

Exercises: No Calculators!

Rename each fraction as a decimal:

1. $\frac{1}{5} =$
2. $\frac{3}{4} =$
3. $\frac{1}{2} =$
4. $\frac{1}{3} =$
5. $\frac{8}{10} =$
6. $\frac{2}{3} =$

Rename each fraction as a percent:

7. $\frac{1}{5} =$
8. $\frac{3}{4} =$
9. $\frac{1}{2} =$
10. $\frac{1}{3} =$
11. $\frac{8}{10} =$
12. $\frac{2}{3} =$

Rename each percent as a decimal:

13. 8% =
14. 60% =
15. 11% =
16. 12% =
17. 40% =
18. 95% =

Order Decimals

Hints/Guide:

To compare decimals and list them from least to greatest, it is easier to compare decimals that are the same place value, so one process we can use to compare decimals is to include trailing zeros to make all of the decimals that same place value. For example, to put the following in order from least to greatest:

.3, 1.61, .006, .107 is easier to compare as:

0.300, 1.610, 0.006, 0.107

to achieve 0.006, 0.107, 0.300, 1.610

and then return to the original form: 0.006, 0.107, 0.3, 1.61

Exercises:

List each group of numbers in order from least to greatest:

1. 20, 4, .6, .08

   _____

2. 246.8, 248.6, 244.9, 246.5

   _____

3. 1.03, 2.4, .89, .987

   _____

4. 14.8, 2.68, .879, 8.47

   _____

5. 5.3, 5.12, 5.38, 5.29

   _____

6. 54.89, 56.3, 58.1, 52.98

   _____

7. 4, .006, .8, .07

   _____

8. 297, 3.456, 64.4, 7.24

   _____

9. 794, 793.8, 794.65, 794.7

   _____

10. 9, 6.7, 7.24, 14

    _____

11. 4.2, 4.19, 4.07, 4.3

    _____

12. 3.75, 6.7, 3.8, .45

    _____

Multiply and Divide Whole Numbers

Hints/Guide:

To multiply whole numbers, we must multiply the first number by one digit of the second number. The key is that when multiplying by each digit we must remember the place value of the number we are multiplying by:

```
  534
x  46
 3204
21360
24562
```

So we first multiply 534 by 6 to get 3204 (This is done by regrouping digits similar to adding, so 6 x 4 = 24, the 4 is written down and the 2 is added to the next product). Next, a zero is placed in the ones digit because when multiplying by the 4 in 46, we are multiplying by the tens digit, or 40. Next, we multiply 534 x 4 to get 21360. Finally, we add the two products together to get 24,564.

To divide whole numbers, we must know basic division rules are the opposite of multiplying rules. So if we know our times tables, we know how to divide (a review over the summer might not be a bad idea!). Since 3 x 4 is 12, then 12 ÷ 4 = 3 and 12 ÷ 3 = 4. Again, we deal with one digit at a time, so:

```
   634
12 | 7608
  - 72
    40
   - 36
     48
   - 48
      0
```

First, we notice that 12 does not divide into 7, so we determine how many times 12 goes into 76. This is 6. Next, multiply 6 x 12 and place the answer, 72, under the 76 you have used. Now, subtract 76 - 72 and place the 4 underneath the 72. Bring down the next digit from the number being divided, which is 0, and determine how many times 12 goes into 40. The answer is 3 and 3 x 12 = 36, so place 36 under the 40. Now, subtract 40 - 36 and place the 4 under 36 and bring down the 8. 12 goes into 48 four times evenly, so there is no remainder in this problem.

Exercises: Solve: No Calculators!

1. 742 x 17

2. 25 x 13

3. 659 x 7

4. 407 x 29

5. 81 x 5

6. $86\overline{)2{,}236}$

7. $57\overline{)13{,}338}$

8. $5\overline{)205}$

9. $7\overline{)1463}$

10. $16\overline{)3840}$

11. $11\overline{)2211}$

12. $9\overline{)3789}$

Add Mixed Numbers

Hints/Guide:

When adding mixed numbers, we add the whole numbers and the fractions separately, then simplify the answer. For example:

$$\begin{array}{r} 4\frac{1}{3} = 4\frac{8}{24} \\ +\,2\frac{6}{8} = 2\frac{18}{24} \\ \hline 6\frac{26}{24} = 6 + 1\frac{2}{24} = 7\frac{2}{24} = 7\frac{1}{12} \end{array}$$

First, we convert the fractions to have the same denominator, then add the fractions and add the whole numbers. If needed, we then simplify the answer.

Exercises: Solve in lowest terms: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $2\frac{1}{4} + 8\frac{1}{2}$

2. $3\frac{8}{15} + 7\frac{1}{3}$

3. $3\frac{3}{5} + 5\frac{1}{2}$

4. $5\frac{3}{8} + 4\frac{1}{4}$

5. $7\frac{3}{7} + 6\frac{1}{2}$

6. $5\frac{5}{9} + 1\frac{1}{3}$

7. $4\frac{1}{3} + 6\frac{1}{4}$

8. $1\frac{2}{3} + 6\frac{1}{4}$

9. $1\frac{2}{9} + 5\frac{2}{3}$

Subtract Mixed Numbers

Hints/Guide:

When subtracting mixed numbers, we subtract the whole numbers and the fractions separately, then simplify the answer. For example:

$$\begin{array}{r} 7\frac{3}{4} = 7\frac{18}{24} \\ -2\frac{15}{24} = 2\frac{15}{24} \\ \hline 5\frac{3}{24} = 5\frac{1}{8} \end{array}$$

First, we convert the fractions to have the same denominator, then subtract the fractions and subtract the whole numbers. If needed, we then simplify the answer.

Exercises: Solve in lowest terms: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $\begin{array}{r} 4\frac{1}{3} \\ -2\frac{1}{4} \\ \hline \end{array}$

2. $\begin{array}{r} 6\frac{3}{4} \\ -\frac{2}{3} \\ \hline \end{array}$

3. $\begin{array}{r} 9\frac{2}{3} \\ -6\frac{1}{4} \\ \hline \end{array}$

4. $\begin{array}{r} 6\frac{3}{4} \\ -5\frac{1}{5} \\ \hline \end{array}$

5. $\begin{array}{r} 7\frac{1}{2} \\ -3\frac{1}{4} \\ \hline \end{array}$

6. $\begin{array}{r} 3\frac{1}{2} \\ -2\frac{3}{10} \\ \hline \end{array}$

7. $\begin{array}{r} 9\frac{7}{10} \\ -4\frac{1}{2} \\ \hline \end{array}$

8. $\begin{array}{r} 8\frac{5}{6} \\ -5\frac{1}{3} \\ \hline \end{array}$

9. $\begin{array}{r} 6\frac{3}{4} \\ -6\frac{5}{8} \\ \hline \end{array}$

Multiply Fractions and Solve Proportions

Hints/Guide:

To solve problems involving multiplying fractions and whole numbers, we must first place a one under the whole number, then multiply the numerators together and the denominators together. Then we simplify the answer:

$$\frac{6}{7} \bullet 4 = \frac{6}{7} \bullet \frac{4}{1} = \frac{24}{7} = 3\frac{3}{7}$$

To solve proportions, one method is to determine the multiplying factor of the two equal ratios. For example:

$\frac{4}{9} = \frac{24}{x}$ since 4 is multiplied by 6 to get 24, we multiply 9 by 6, so $\frac{4}{9} = \frac{24}{54}$.

Since the numerator of the fraction on the right must be multiplied by 6 to get the numerator on the left, then we must multiply the denominator of 9 by 6 to get the missing denominator, which must be 54.

Exercises: Solve (For problems 8 - 15, solve for N): No Calculators!
SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $4 \bullet \frac{3}{4} =$
2. $\frac{1}{5} \bullet 7 =$
3. $8 \bullet \frac{1}{5} =$
4. $6 \bullet \frac{3}{7} =$
5. $\frac{4}{5} \bullet 4 =$
6. $\frac{2}{3} \bullet 6 =$
7. $7 \bullet \frac{1}{4} =$
8. $\frac{1}{5} = \frac{n}{20}$
9. $\frac{3}{n} = \frac{12}{28}$
10. $\frac{1}{n} = \frac{5}{25}$
11. $\frac{n}{4} = \frac{3}{12}$
12. $\frac{3}{7} = \frac{12}{n}$
13. $\frac{n}{9} = \frac{12}{27}$
14. $\frac{2}{3} = \frac{18}{n}$
15. $\frac{2}{7} = \frac{n}{21}$

Add and Subtract Decimals

Hints/Guide:

When adding and subtracting decimals, the key is to line up the decimals above each other, add zeros to have all of the numbers have the same place value length, then use the same rules as adding and subtracting whole numbers, with the answer having a decimal point in line with the problem. For example:

$$34.5 + 6.72 + 9.045 = \begin{array}{r} 34.5 \\ 6.72 \\ +\ 9.045 \\ \hline \end{array} = \begin{array}{r} 34.500 \\ 6.720 \\ +\ 9.045 \\ \hline 50.265 \end{array}$$

AND

$$5 - 3.25 = \begin{array}{r} 5.00 \\ -\ 3.25 \\ \hline 1.75 \end{array}$$

No Calculators!

Exercises: Solve:
SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $15.7 + 2.34 + 5.06 =$

2. $64.038 + 164.8 + 15.7 =$

3. $2.6 + 64.89 + 4.007 =$

4. $12.9 + 2.008 + 75.9 =$

5. $\begin{array}{r} 543.8 \\ 27.64 \\ +\ 6.9 \\ \hline \end{array}$

6. $2.6 + 4.75 =$

7. $43.31 + 7.406 =$

8. $\begin{array}{r} 64.9 \\ 343.6 \\ +\ 6.007 \\ \hline \end{array}$

9. $6.45 + 54.9 =$

10. $3.8 + .76 + .008 =$

11. $87.4 - 56.09 =$

12. $5.908 - 4.72 =$

13. $68.9 - 24.74 =$

14. $955.3 - 242.7 =$

15. $\begin{array}{r} 695.42 \\ -\ 44.79 \\ \hline \end{array}$

16. $432.97 - 287.32 =$

17. $43.905 - 9.08 =$

18. $\begin{array}{r} 78.9 \\ -\ 54.7 \\ \hline \end{array}$

19. $200 - 14.96 =$

20. $15 - 2.43 =$

Multiply and Divide Decimals

Hints/Guide:

To multiply decimals, the rules are the same as with multiplying whole numbers, until the product is determined and the decimal point must be located. The decimal point is placed the same number of digits in from the right of the product as the number of decimal place values in the numbers being multiplied. For example:

8.54 x 17.2, since 854 x 172 = 146888, then we count the number of decimal places in the numbers being multiplied, which is three, so the final product is 146.888 (the decimal point comes three places in from the right).

To divide decimals by a whole number, the process of division is the same, but the decimal point is brought straight up from the dividend into the quotient. For example:

$3\overline{)51.06}$ $\quad 17.02$ The decimal point moves straight up from the dividend to the quotient.

Exercises: Solve: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. 63 x .14	2. .87 x 2.3	3. 8.94 x 2.1	4. 4.2 x .62
5. 34.5 x 4.7	6. 32.1 x .45	7. 91.4 x 47	8. 3.9 x 11

9. $35\overline{)70.35}$ 10. $7\overline{)25.83}$ 11. $14\overline{)45.584}$

Parentheses
Exponents
Multiply
Divide
~~Addition~~
Subtraction

Multiply OR Divide (which ever comes first Left to right

Add OR Subtract (which ever comes first left to right

Order of Operations

1) $(31 - 3) \div 2 + 3^2$

2) $(37 - 5) \div 16 - 3^2$

3) $(14 - 3)^2 + (8 \div 4)$

4) $6 \times (8 - 5) - 9^2$

5) $(52 - 2^2) \div (13 + 3)$

6) $(13 \times 2 + 9^2) + 4$

7) $8 \times (13 + 5) - 2^2$

8) $(11 - 2)^2 + (20 \div 4)$

9) $(8 \times 5 + 2^2) - 2$

10) $(40 - 2^2) \div (21 - 3)$

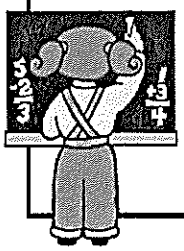
Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Determine the unknown in a linear equation (multiplication & division).

- In a **multiplication equation**, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation $2x = 8$, the coefficient is 2.
- **Multiplication equations**: Divide both sides by the coefficient so that the two sides remain equal.
- In a **division equation**, the number by which the variable is divided is called the **divisor**. In the division equation $\frac{x}{4}$, 4 is the divisor.
- **Division equations**: Multiply both sides of the equation by the divisor so that the two sides remain equal.

Examples:

$4b = 16$	original equation	$\frac{m}{6} = 11$	original equation
$\frac{}{4} \quad \frac{}{4}$	divide both sides by 4	$6 \times \frac{m}{6} = 11 \times 6$	multiply each side by 6
$1b = 4$	solution	$1m = 66$	solution
$b = 4$	simplify	$m = 66$	simplify

1.) $7x = 63$	**2.)** $\frac{k}{9} = 8$
3.) $5b = 3.55$	**4.)** $\frac{n}{7} = 5.55$
5.) $12m = 84.72$	**6.)** $\frac{p}{13} = 2.67$



Find Percent of a Number

Hints/Guide:

To determine the percent of a number, we must first convert the percent into a decimal by dividing by 100 (which can be short-cut as moving the decimal point in the percentage two places to the left), then multiplying the decimal by the number. For example:

45% of 240 = 45% x 240 = 0.45 x 240 = 108

No Calculators!

Exercises: Solve for n:

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

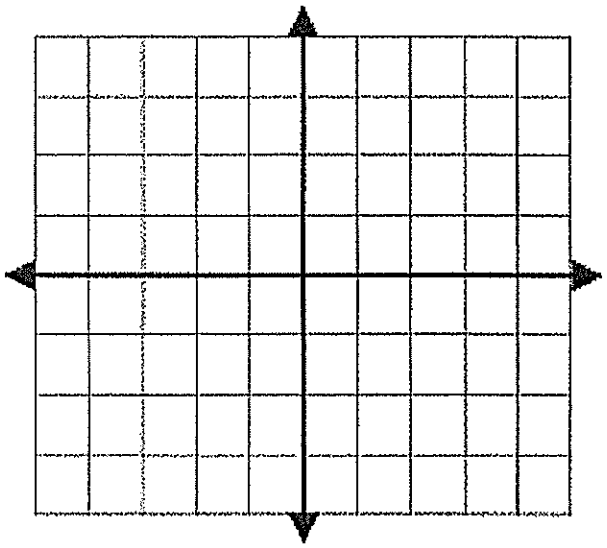
1. 30% of 450 = n
2. 7% of 42 = n
3. 10% of 321 = n
4. 15% of 54 = n
5. 65% of 320 = n
6. 80% of 64 = n
7. 9% of 568 = n
8. 15% of 38 = n
9. 25% of 348 = n
10. 85% of 488 = n
11. 90% of 750 = n
12. 6% of 42 = n
13. 60% of 78 = n
14. 4% of 480 = n
15. 10% of 435 = n
16. 24% of 54 = n

Compare the integers with <, >, or =.

45. $-4 \bigcirc -5$	46. $2 \bigcirc -2$	47. $\lvert -5 \rvert \bigcirc \lvert 5 \rvert$	48. $-7 \bigcirc 6$	49. $-13 \bigcirc -9$
50. $\lvert -7 \rvert \bigcirc -6$	51. $-17 \bigcirc -14$	52. $\lvert -3 \rvert \bigcirc \lvert -2 \rvert$	53. $0 \bigcirc -6$	54. $\lvert -4 \rvert \bigcirc \lvert 6 \rvert$

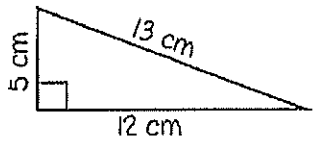
Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

55. A(2, 4)	56. B(0, -3)
57. C(1, -1)	58. D(3, 3)
59. E(-4, 1)	60. F(2, 0)
61. G(-3, -2)	62. H(-2, 3)
63. I(0, 2)	64. J(-1, -4)

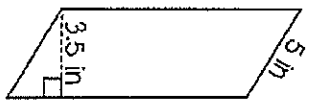


Find the perimeter, area, and/or volume of the given figure.

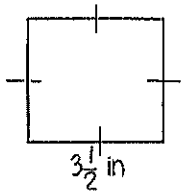
65. Find the perimeter & area:



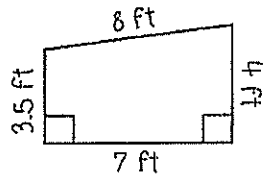
66. Find the perimeter & area:



67. Find the perimeter & area:



68. Find the perimeter & area:



69. Find the area of a square with a perimeter of 45 cm

70. Find the volume: